

## Amendment and Remarks

Serial No.: 09/345,335

Confirmation No.: 1129

Filed: July 1, 1999

For: PROCESS VARIABLE GENERALIZED GRAPHICAL DEVICE DISPLAY AND METHODS REGARDING SAME

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D1

corresponds to a process variable, wherein at least one graphical device for a corresponding process variable comprises:

- a gauge axis;
- a first pair of high and low limit elements representative of engineering hard high and low limit values for the corresponding process variable and a second pair of high and low limit elements representative of operator set high and low limit values for the corresponding process variable, where the first and second pair of high and low limit elements are displayed on the gauge axis; and
- a graphical shape displayed along the gauge axis representative of a value of the corresponding process variable relative to the process limit values.

C2

3. (Twice Amended) The graphical user display of claim 1, wherein the at least one graphical device comprises a first pair of parallel lines extending orthogonal to the gauge axis representative of the engineering hard high and low limit values for the corresponding process variable and a second pair of pair of parallel lines extending orthogonal to the gauge axis representative of the operator set high and low limit values for the corresponding process variable.

C3

9. (Once Amended) The graphical user display of claim 1, wherein the graphical device further comprises a graphical symbol representative of an optimization characteristic for the corresponding process variable.

C4

13. (Once Amended) The graphical user display of claim 1, wherein the at least one graphical device further comprises a graphical symbol representative of the corresponding process variable being constrained to set point.

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C4  
14. (Once Amended) The graphical user display of claim 1, wherein the at least one graphical device further comprises a graphical symbol representative of the corresponding process variable being wound up.

C5  
19. (Once Amended) The graphical user display of claim 18, wherein the graphical user display comprises a matrix display having the manipulated variables displayed along a first axis thereof and the controlled variables displayed along a second axis thereof, wherein each of the manipulated and controlled variables includes a graphical device displayed in proximity thereto.

C6 Sub D2  
21. (Twice Amended) A computer implemented method for providing a graphical user display for providing real-time process information to a user for a process that is operable under control of one or more process variables, wherein one or more of the process variables has high and low process limit values associated therewith, the method comprising the step of displaying at least one graphical device for a corresponding process variable, wherein displaying the at least one graphical device comprises:

displaying a gauge axis;  
displaying a first pair of high and low limit elements representative of engineering hard high and low limit values for the corresponding process variable and a second pair of high and low elements representative of operator set high and low limit values for the corresponding process variable on the gauge axis; and  
displaying a graphical shape along the gauge axis representative of a value of the corresponding process variable relative to the high and low process limit values.

C7  
23. (Twice Amended) The method of claim 21, wherein displaying the first pair of high and low limit elements representative of engineering hard high and low limit values comprises displaying a first pair of parallel lines extending orthogonal to the gauge axis, and further

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wherein displaying the second pair of high and low limit elements representative of operator set high and low limit values comprises displaying a second pair of parallel lines extending orthogonal to the gauge axis.

C7  
24. (Twice Amended) The method of claim 21, wherein displaying at least one pair of high and low limit elements comprises displaying a single pair of parallel lines extending orthogonal to the gauge axis to represent both the engineering hard high and low limit values and the operator set high and low limit values for the corresponding process variable when the operator set high and low limit values are set at the engineering hard high and low limit values.

C8  
27. (Twice Amended) The method of claim 23, wherein displaying the graphical shape along the gauge axis comprises displaying the graphical shape at position adjacent one of the first or second pair of high and low limit elements when the value for the corresponding process variable is within a certain range of one of the high and low process limit values.

28. (Twice Amended) The method of claim 23, wherein displaying the graphical shape along the gauge axis comprises displaying the graphical shape at position outside of the parallel lines when the value for the corresponding process variable is outside the second pair of high and low elements representative of operator set high and low process limit values by at least a predetermined percentage.

29. (Once Amended) The method of claim 21, wherein the method further comprises displaying a graphical symbol representative of an optimization characteristic for the corresponding process variable along the gauge axis.

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C9  
33. (Once Amended) The method of claim 21, wherein displaying the graphical shape along the gauge axis further comprises displaying a graphical symbol representative of the corresponding process variable being constrained to set point.

34. (Once Amended) The method of claim 21, wherein displaying the graphical shape along the gauge axis further comprises displaying a graphical symbol representative of the corresponding process variable being wound up.

35. (Once Amended) The method of claim 21, wherein displaying the graphical shape along the gauge axis comprises displaying a circle along the gauge axis.

36. (Once Amended) The method of claim 21, wherein the method further comprises:  
determining a state of a current value for the corresponding process variable; and  
displaying the graphical shape in a color of a set of colors that reflects the determined state for the corresponding variable.

37. (Twice Amended) The method of claim 36, wherein determining the state of the current value comprises determining whether the current value of the corresponding process variable is within the second pair of high and low limit values, whether the current value of the corresponding process variable is within a certain percentage of one of the second pair of high and low limit values, and whether the current value of the corresponding process variable is outside of the second pair of high and low limit values.

38. (Once Amended) The method of claim 21, wherein the process is a continuous multivariable process being performed at a process plant, wherein the continuous multivariable is

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operable under control of at least manipulated variables and controlled variables of the one or more process variables, and further wherein the method comprises:

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C10  
displaying a matrix display having the manipulated variables displayed along a first axis thereof and the controlled variables displayed along a second axis thereof; and

displaying a graphical device in proximity to each of the manipulated variables and controlled variables.

39. (Once Amended) The method of claim 21, wherein the method further comprises:

receiving user input to select a displayed graphical device; and

displaying detailed information for the process variable corresponding to the selected graphical device, wherein the detailed information is displayed on the same screen with the graphical device.

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40. (Once Amended) A graphical user display comprising one or more graphical devices for providing real-time process information to a user for a continuous multivariable process being performed at a process plant and operable under control of at least manipulated variables and controlled variables of a plurality of process variables, wherein the graphical user display comprises a display providing the manipulated variables and the controlled variables, and wherein one or more of the process variables comprise high and low process limit values associated therewith, wherein each of a plurality of the one or more graphical devices corresponds to a process variable, wherein each graphical device corresponding to a process variable comprises:

a gauge axis;

a first pair of high and low limit elements representative of engineering hard high and low limit values for the corresponding process variable and a second pair of high and low limit elements representative of operator set high and low limit values for the corresponding process

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variable, where the first and second pair of high and low limit elements are displayed on the gauge axis; and

a graphical shape displayed along the gauge axis representative of a value of the corresponding process variable relative to process limit values that provides real-time process information to a user for the process, and further wherein each of the plurality of graphical devices is displayed in proximity to one of the manipulated and controlled variables.

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